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Macroeconomic Signals and Indian Real Estate Firms

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Abstract

Purpose: India's real estate sector has been growing in size and influenced the country's economic growth. This paper studies the link between listed real estate firms in India and macro-economic activities and growth. Therefore, it examines the effect of rural production, foreign inflows, capital market growths, and money flows on the activities of real estate firms listed in the Indian stock exchanges.

Methodology: The paper uses data of 65 listed real estate firms from 2001 to 2016. It uses a multivariate regression model to examine the relationship, and the effect of the rural economy, financial markets, international flows, and money flows on real estate firms. The regression models use firm-specific measures and different determinants of macroeconomic variables for the analysis.

Findings: The findings suggest that macroeconomic variables signal a potential increase in the real estate industry's performance. An increase in foreign direct investment leads to increasing real estate activities. Personal remittances bring more revenues for real estate firms but not the stock returns of these firms. Capital markets growth has limited influence on this sector. Money flows, notably savings, positively affect the real estate industry. However, the rural economy does not significantly affect real estate activities.

Unique Contribution to Theory, Policy and Practice: The study proposes that Indian real estate sector needs more transparent and regulatory structures to reap the benefits of the expected growth of the economy. Government should bring policies to capital market reform specifically towards real estate industry to generate interests among domestic and international investors in this sector.

Keywords: *Real Estate Industry, Macroeconomic Variables, Capital Markets, Rural Economy*

JEL Classification: C21, G11, O11, O16

Introduction

Macroeconomic signals play an essential role in the real estate sector in today's economies and businesses. The firms in the real estate sector adjust their activities and investment based on long-term linkages with the underlying interaction of domestic economic and global factors. The structure and condition of the local economy, capital market, and macroeconomic fundamentals are sensitive to the development and growth of real estate firms. After liberalization and opening of the economy in the early 1990s, India has been deregulating and reducing the barriers in the real estate sector (Sharma, 2018). India's

economic success has elicited consideration of various economic fundamentals and implications for the real estate sector.

Indian real estate sector is unique in its characteristics. It deals with the plethora of state-specific and federal laws. The addition and formation of various laws emanate from diverse and multifaceted ethnic and religious sects in inheritance and devolution. Several laws draw significant influence from divergent practices and norms apart from codified laws. Further, judicial pronouncements and precedents have also adjudged on real estate sector dynamics. In terms of the economics of this sector, it is the second largest source of employment. The sector contributes 6-7% to the nation's GDP. It is one of the sectors of the economy that has grown fast in the last two decades. Further, this sector has received a significant amount of foreign direct investment, over $27 billion from 2000 to 2016. In this background, this paper studies the macroeconomic variables and their relationship with the listed real estate firms' activities and performance (India Brand Equity Foundation, 2021).

Real estate firms invest in real properties and deal with localized economic surroundings with national and international effects of the economic conditions; they have enduring relationships with the country's macroeconomic variables. In this context, this paper analyzes the effect of macroeconomic variables on the real estate sector. This paper contributes to the existing literature and debate by focusing on rural production, foreign inflows, capital market growths, and economic money flows and their interlinkages with real estate firms. It recognizes the various components of emerging market economies, particularly rural production, as a significant factor of the GDP. Further, it investigates the association of investible components, i.e., financial markets and money flow in the economy. Thus, it provides an understanding of critical macroeconomic variables affecting real estate firms and markets for emerging economies. The real estate firm's stock performance and investment indicate to investors the underlying macroeconomic risk factors and capital market future.

The basic idea is that in an agricultural-dominated economy, the rural economy will significantly shape the real estate sector. Unskilled laborers or construction workers mostly come from rural and agricultural areas. The liberalization and gradual opening up of the economy for foreign investments spur real estate activities. The increasing role of financial sectors in the economy influences capital markets, and money flows to lead the real estate markets. These economic variables also divulge signals to the real estate firms for their plans and outlays. As a result, this paper's findings provide valuable policy formulation and implication information.

Rules and regulations at multiple levels have governed real estate sectors. They face legal, credit, and macroeconomic risks regardless of economic conditions. It is a well-settled argument that finance and money availability influence growth. Prior research shows that real estate firm values are affected and driven by the amount of credit volume supplied in the economy. The credit volume is based on the economy size and determined within the economy (Mian and Sufi, 2009; Glick and Lansing, 2010; Pavlov and Wachter, 2011). In the case of global evidence, Pavlov, Steiner, and Wachter (2015) find the link between the performance of international real estate firms and available credits in the local markets.

A significant economic policy change affects the goods and services of higher value. The real estate sector has been shaped and influenced by underlying economic trends. Gulgulia (2016) states that the real estate industry is one of the most sensitive industries exposed to changes in economic policies. Sanfelici and Halbert (2016) suggest that local governments foster and encourage real estate players to attract investments and ventures in real estate. Yousef (2019) indicates that a lower cost of financing allows the real estate firm to be more leveraged, more prominent in size, have more retained earnings, and have a higher level of assets. Brodeur et al. (2020) suggest that financial markets and macroeconomic fundamentals are connected to real estate dynamics like home developers, financial institutions, and households.

Real estate firms follow capital market trends. The volatility and uncertainty of the securities markets affect the cash flows and high costs for the firms. Stevenson (2002) finds that real estate stocks show long-term performance momentum. He notes that the real estate stocks' momentum differs from other firms' stocks. Lee and Kuo (2010) examine real estate securities under different capital market performances. They find an asymmetric effect on real estate securities during bullish or bearish markets. Analyzing the momentum effects of Chinese real estate firm performance, Lee et al. (2012) find that the stocks of real estate firms are directly related to past turnover ratios.

In the case of the Indian real estate sector, the financing and investments came through banks, non-banking financial institutions, high-net-worth individuals, and deposits from buyers. After liberalization and opening up the economy post-2000, multiple financing options surfaced, including foreign direct investments. Mehta (2016) notes that the real estate sector has reduced the dependency on traditional forms of financing. In favor of capital markets. However, Verma and Verma (2017) observe that the real estate segment has allowed the involvement of cash dealings and tainted money.

Nevertheless, Sanjeevkumar (2017) mentions that Indian Government has instituted rules and regulations to bring transparency to real estate transactions. Vaishali, Aman, and Sehrawat (2018) expect the Indian real estate sector to be more reliable, transparent, and efficient. Ajinkya et al. (2018) state that the demonetization exercise by the Indian Government will make the real estate sector to be more institutionalized funding.

The paper employs a practical empirical framework for estimating real estate firms in a multifactor macroeconomic variable regressing with income expense ratio and stock performance. This approach helps to evaluate the relationship statistically. Emerging economies regularly alter their key parameters to adjust to a changing global economic environment. Therefore, the study of the real estate sector exploring the macroeconomic variables, particularly the selection of variables and control variables, becomes challenging.

The empirical results reveal that the real estate sector responds to changes in financial and macroeconomic indicators. Money flows are essential for the growth of the real estate sector. Capital markets growth influence this sector. Personal remittances have a positive role in real estate activities. The rural economy is not tightly integrated with the real estate

industries. Overall, the findings show the interface of various macroeconomic variables under constraints affecting real estate markets. These macroeconomic variables have a signaling effect on the Indian real estate sector, specific to the study under consideration.

The rest of the paper unfolds as follows. Section II discusses the data and econometric model. Section III presents the results. Finally, Section IV concludes the paper.

Data and Methodology

The paper obtains sample data from the real estate firms listed in the Indian stock exchanges from 2001 to 2016. The data is obtained for the firm-specific variables from the Prowess database. It maintains the financial information on all listed firms in India. For country-specific macroeconomic variables, the data is obtained from the World Bank. These data variables are on an annual basis. If a real estate firm does not have data for five years, it is dropped from the sample. Thus, there are 65 listed firms in the sample for the study. These sample firms primarily fall into two categories: the firms engaged in the development and construction of housing colonies and real estate and the property management, construction, and financing of real estate.

The paper uses a multivariate regression model to examine the relationship, and the effect of the rural economy, financial markets, international flows, and money flows on real estate firms. These indicators help assess the underlying economic trends and establish business goals, making long-term financial goals for real estate firms. The econometric models help to study the effects of broader financial and macroeconomic variables on real estate firms. These models use firm-specific measures and different determinants of macroeconomic variables for the analysis. The control variables are chosen based on past studies.

The paper first begins to examine the ability of the rural economy to influence the real estate sector. Food Production and Inflation are used as variables of concern to assess rural production. The following equation estimates the time series panel data:

$$Y_{it} = \alpha_i + \beta_{1Food\ Prod.Ind} + \beta_{2\ Inflation} + \sum_{j=1}^{J} \beta_j\ Cont\ Var\ Ret_{j,it} + \varepsilon_{it} \qquad (1)$$

where Y_{it} is either the Income Expense Ratio or Excess Return of the firm i in year t. β_1 and β_2 are the Food Production Index and Inflation coefficients, respectively. Ret_{it} is a vector of control variables such as revenue growth and asset growth of the firm and GDP growth of the country. ε_{it} is the standard error term of the equation.

Second, it analyzes the influence of foreign inflows, including foreign direct investment and personal remittances, which are well-known variables in increasing real estate activities.

$$Y_{it} = \alpha_i + \beta_{1FDI\ Level} + \beta_{2\ Remittance\ Level} + \sum_{j=1}^{J} \beta_j\ Cont\ Var\ Ret_{j,it} + \varepsilon_{it} \qquad (2)$$

Third, it explores the relationship between capital market growth and real estate firm performance. S&P Global Equity and Domestic Market Capitalization indicate the opportunity for real estate firms to access capital in the financial markets.

$$Y_{it} = \alpha_i + \beta_{1Intl.\ Cap\ Mar} + \beta_{2Capital\ Mar\ Size} + \sum_{j=1}^{J} \beta_j\ Cont\ Var\ Ret_{j,it} + \varepsilon_{it} \quad (3)$$

Lastly, it investigates the effect of money flows on the real estate sector. Money flows broadly indicate the money movement in the economy and are a core for the growth and expansion of the real estate segment. It includes gross domestic savings, Broad Money, and Gross Capital Formation in the economy.

$$Y_{it} = \alpha_i + \beta_{1GDS} + \beta_{2Borad\ Money} + \beta_{3GCF} + \sum_{j=1}^{J} \beta_j\ Cont\ Var\ Ret_{j,it} + \varepsilon_{it} \quad (4)$$

The paper employs two measures of dependent variables. The first measure is the accounting variable, i.e., the Income Expense Ratio. It is defined as the ratio of operating income over operating expenses of real estate firms. The second measure is a market-based variable, i.e., Annual Stock Return. It is the total annual stock return as reported by the Prowess. Both measures are important factors in disentangling the objectivity of macroeconomic variables determining the real estate future and development.

Empirical Results

Table 1 presents the summary statistics of the real estate firms and macroeconomic variables used in the paper. The mean value of the income expense ratio, a key figure for being a healthy real estate firm, is 1.238, while the median value of the ratio is 1.027. It suggests that the real estate firms have been generating more operating income than that operating expenses during the sample period. It indicates that these firms are growing and churning out sufficient cashflows. The annual stock returns are positive (mean = 1.129%, median = 0.560%). The positive and lower percentage of returns indicate that investors have mixed sentiments toward the real estate segment due to the inherent uncertainty in this sector. The revenue and asset growths are positive, suggesting that real estate has been growing. The high standard deviation for revenue and asset growth suggests the volatility in their operations. Considering India is a developing economy, inflation has been moderate (6.92%) during the period. Foreign direct investment and personal remittance as a percentage of GDP are good. The capital markets indicators, i.e., Standard and Poor's Global Equity and market capitalization, show higher variability as described by their standard deviations. The money flows variables, i.e., gross domestic savings, broad money, and gross capital formation, look strong during the sample period.

Table 1: Summary Statistics

Real Estate Firms and Macroeconomic Variables Summary Statistics

Variables	N	Mean	Median	Standard Deviation
Income Expense Ratio	816	1.238	1.027	1.110
Annual Stock Return	631	1.129	0.560	4.084
Revenue Growth	777	4.731	0.147	37.941
Asset Growth	802	3.055	0.137	33.034
Gross Domestic Product Growth Rate	1007	7.018	7.417	2.238
Food Production Index	995	110.259	114.380	16.261
Inflation	1007	6.918	6.353	2.935
Foreign Direct Investment as % of Gross Domestic Production	1007	1.581	1.512	0.788
Personal Remittance as % of Gross Domestic Production	1007	3.213	3.130	0.444
Standard and Poor's Global Equity Index Change	1007	17.485	20.090	45.008
Market Capitalization as % of Gross Domestic Production	934	64.462	55.309	32.706
Gross Domestic Savings as % of Gross Domestic Production	1007	29.424	30.458	3.397
Broad Money as % of Gross Domestic Production	1007	68.851	70.999	8.139
Gross Capital Formation as % of Gross Domestic Production	995	9.337	11.726	9.840

The above table presents summary statistics. The real estate firm and macroeconomic variables are defined as follows: *Income Expense Ratio* is the operating income ratio over operating expense of the real estate firms traded on the Indian Stock Exchanges. *Annual Stock Return* is the yearly total return of the real estate firms as reported by the Prowess. *Revenue Growth* represents the firm's annual growth in income. *Assets Growth* is total assets growth annually. *Gross Domestic Product Growth Rate (GDP Growth Rate)* is the GDP growth rate. *The food Production Index* represents the total food production in the country, indicating the agriculture sector. *Inflation* is the increase in the general level of prices based on the Consumer Price Index. *Foreign Direct Investment as % of Gross Domestic Production (FDI as % of GDP)* is the foreign direct investment in the country as % of the country's GDP. *Personal Remittance as % of Gross Domestic Production (Personal Remit as % of GDP)* is the nonresident workers' Remittance in the country as % of its GDP. *Standard and Poor's Global Equity Index Change (S&P Global Equity)* is the

S&P Global Equity in U.S. dollar price change of the Indian stock markets. *Market Capitalization as % of Gross Domestic Production (Market Cap as % of GDP)* is the total market value of the listed firms as% of the GDP. *Gross Domestic Savings as % of Gross Domestic Production (GDS as % of GDP)* is the GDP minus final consumption expenditure. *Broad Money as % of Gross Domestic Production (Broad Money as % of GDP*) is the M3 as % of GDP. *Gross Capital Formation as % of Gross Domestic Production (GCF as % of GDP)* is the gross capital formation consisting of expenses on additions to the fixed assets of the economy plus net changes in the level of inventories as % of GDP.

The paper checks correlations among variables to get reliable estimates from regression models and avoid multicollinearity issues. Table 2 provides the correlation statistics. The income expense ratio and annual stock returns have low correlations. As expected, the income-expense ratio is positive with all variables except asset growth and gross capital formation. When real estate firms invest more money in assets and capital investments, the expenses will go up, resulting in a negative correlation. All control variables, i.e., revenue growth, asset growth, and GDP Growth rate, correlate below 0.60, suggesting all can be part of control variables.

Regarding the explanatory variables, the regression models use variables with reasonable correlations. The food Production Index and Inflation show a high level of correlation. However, the variance inflation factors of these models do not show the multicollinearity problems.

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Table 2: Correlation Statistics

Variables	Income Expense Ratio	Annual Stock Return	Revenue Growth	Asset Growth	GDP Growth	Food Production Index	Inflation	FDI as % of GDP	Personal Remit as % of GDP	S&P Global Equity	Market Cap as % of GDP	GDS as % of GDP	Broad Money as % of GDP	GCF as % of GDP
Income Expense Ratio	1.000													
Annual Stock Return	0.051	1.000												
Revenue Growth	0.084	0.010	1.000											
Asset Growth	-0.018	0.009	0.543	1.000										
GDP Growth	0.018	0.138	-0.053	0.035	1.000									
Food Production Index	0.071	-0.018	0.016	0.028	0.167	1.000								
Inflation	0.073	-0.014	0.010	0.064	0.228	0.860	1.000							
FDI as % of GDP	0.104	-0.011	0.036	0.065	0.013	0.465	0.563	1.000						
Personal Remit as % of GDP	0.083	-0.171	0.043	0.036	-0.247	0.697	0.661	0.553	1.000					
S&P Global Equity	0.012	-0.008	-0.036	0.061	0.689	-0.110	-0.002	-0.131	-0.152	1.000				
Market Cap as % of GDP	0.064	0.148	-0.023	0.035	0.748	0.498	0.469	0.389	0.081	0.578	1.000			
GDS as % of GDP	0.077	0.205	-0.005	0.044	0.703	0.576	0.505	0.522	0.161	0.262	0.804	1.000		
Broad Money as % of GDP	0.095	-0.014	0.027	0.066	0.289	0.898	0.883	0.660	0.731	0.062	0.556	0.706	1.000	
GCF as % of GDP	-0.013	0.180	-0.045	0.019	0.706	-0.290	-0.246	-0.175	-0.531	0.529	0.380	0.444	-0.095	1.000

The above table shows the correlation between real estate firms and macroeconomic variables. *The income Expense Ratio* is the ratio of total income over the total expense of the real estate firms traded on the Indian Stock Exchanges. Other variables are defined in Table 1 legend.

This paper attempts to glean signals from macroeconomic variables examining the rural economy as represented by food production and inflation, foreign inflows as represented by foreign direct investment and personal remittance, and capital markets growth as represented by S&P global equity and market capitalization. Money flows as represented by gross domestic savings, broad money, and gross capital formation and how they affect the real estate firms. It prespecifies that these variables will capture the economy's pervasive signals to determine the real estate firm's performance sensitivities.

It uses annual data for multivariate analysis. Therefore, there could be a concern about control for fixed effects. It becomes an issue if there is a strong correlation between dependent and endogenous variables. The correlation statistics in Table 2 do not suggest a high level of correlation ship, so there is no specific concern to control for fixed effects in the regression models. The control variables are revenue growth, asset growth, and GDP growth. The expectation is that firm-specific and general economic factors influence the dependent variables. Therefore, they are included in all regression models.

Table 3 illustrates real estate firm's relationship with the rural economy. Models 1 and 4 of this table show the relationship of control variables with the real estate firm-specific dependent variables, i.e., income and expense ratio and annual stock return. As expected, the estimates of Model 1 show that revenue growth is positively and significantly related to the income-expense ratio, while asset growth is negatively and significantly related to it. A real estate firm with higher revenue growth tends to have higher operating income, resulting in a higher income-expense ratio. In the case of asset growth, the real estate firm spends money to acquire the asset resulting in a negative relationship. The estimates of Model 4 display GDP growth to be positively and significantly related to annual stock return. If the GDP growth rate is high, the real estate firm performs well, resulting in higher annual stock returns. When the rural economy proxy, i.e., food production index, and inflation, are included in the models, the estimates of both variables are weakly related to the income expense ratio.

In contrast, they are not related to annual stock returns. The results suggest that the rural economy is not directly affecting the real estate firms. In other words, real estate activities are more concentrated in the urban areas and have little presence in the rural areas and economy.

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Table 3: Real Estate Firms and Rural Economy

Variables	Income Expense Ratio as Dependent Variable			Annual Stock Return as Dependent Variable		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Food Production Index			**0.005**			-0.003
			(1.71)			(-0.22)
Inflation		**0.024**			-0.076	
		(1.65)			(-0.91)	
Revenue Growth	**0.004**	**0.004**	**0.004**	0.003	0.003	0.003
	(2.95)	**(2.93)**	**(2.94)**	(0.25)	(0.28)	(0.26)
Asset Growth	**-0.005**	**-0.005**	**-0.005**	-0.007	-0.006	-0.007
	(-1.96)	**(-1.98)**	**(-2.01)**	(-0.07)	(-0.06)	(-0.07)
GDP Growth	0.020	0.013	0.017	**0.253**	**0.276**	**0.252**
	(1.01)	(0.67)	(0.88)	**(2.51)**	**(2.66)**	**(2.48)**
Intercept	**1.104**	**0.967**	**0.606**	-0.705	-0.198	-0.286
	(7.57)	**(5.78)**	**(1.86)**	(-0.92)	(-0.21)	(-0.14)
Adj.R Square	0.08	0.08	0.08	0.07	0.07	0.07
No. of Obs.	777	777	772	629	629	624

The above table presents regression results of real estate firms' engagement with the rural economy, particularly food production. The variables are defined in Table 1 legend. The upper part reports the estimates. Numbers in parentheses are *t*-statistics.

Table 4 reports the multivariate regression results about the influence of foreign inflows on the real estate sector. Literature notes that foreign direct investment, as capital inflows, increases domestic investments. It improves employment and living standards and steers the economy's overall growth. Foreign direct investment is not simply proxying the foreign inflows but has an independent influence. Remittances provide a crucial source of income for families having a multiplier effect on the economy and a boost to economic growth. Thus, both factors focus on improving the economy, positively influencing the real estate sector.

Models 1 and 2 show that foreign direct investment and personal remittance are positively and significantly related to the income expense ratio. When both variables are included in Model 3, the coefficients are positively related to the income expense ratio but not significant, suggesting that foreign inflows bring positivity to the real estate sector. When both variables are analyzed with respect to annual stock return (Model 6), personal remittance is negatively and significantly related to real estate firm stock return. A possible explanation for the negative relationship of personal remittance could be that the families continue to tend to their day-to-day expenses instead of investing directly in real estate stocks. Further, the increase in remittances leads to families

investing money into real properties, education, and health. However, foreign direct investment is positively related to stock return but is insignificant. Overall, foreign inflows are important for the real estate sector but are not significant factors in real estate performance.

Table 4: The Influence of Foreign Inflows on the Real Estate Sector

Variables	Income Expense Ratio as Dependent Variable			Annual Stock Return as Dependent Variable		
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
FDI as % of GDP		**0.138**	0.100		0.077	0.529
		(2.53)	(1.39)		(0.27)	(1.57)
Personal Remit as % of GDP	**0.231**		0.108	**-1.34**		**-2.003**
	(2.26)		(0.79)	**(-2.01)**		**(-2.54)**
Revenue Growth	**0.004**	**0.004**	**0.004**	0.003	0.003	0.004
	(2.90)	**(2.90)**	**(2.89)**	(0.26)	(0.26)	(0.36)
Asset Growth	**-0.005**	**-0.005**	**-0.005**	-0.003	-0.007	-0.006
	(-1.96)	**(-1.99)**	**(-1.98)**	(-0.03)	(-0.07)	(-0.06)
GDP Growth	0.036	0.022	0.029	0.101	**0.258**	0.061
	(1.73)	(1.12)	(1.35)	(0.80)	**(2.52)**	(0.47)
Intercept	o.232	**0.856**	0.520	**5.056**	-0.879	**6.652**
	(0.56)	**(4.92)**	(1.13)	**(1.70)**	(-0.87)	**(2.13)**
Adj.R Square	0.08	0.08	0.09	0.08	0.08	0.10
No. of Obs.	777	777	777	629	629	629

The above table presents regression results of the real estate sector being affected by foreign inflows. Foreign Direct Investment and Personal Remittance primarily represent the foreign inflows. Other variables are defined in Table 1 legend. The upper part reports the estimates. Numbers in parentheses are *t*-statistics.

The real estate industry deals with high-value products and investments. The capital market is an efficient financial intermediary that can advance real estate firms' growth. If the size of the capital markets goes up, the investors' wealth also rises, leading to more demand for real estate properties. S&P Global Equity ranking indicates how the country can attract foreign portfolio investment in the capital markets. Table 5 displays the regression results of the capital market effect on real estate firms. Models 1 and 3 reveal that market capitalization has a positive and significant relationship with the income-expense ratio of a real estate firm. When market capitalization is explored with the stock return (Model 4 and 6), it has a positive sign but is not significant with the annual return.

The ranking of the capital markets does not affect the real estate industry. Overall, this table's results imply that the capital market has a limited influence on the real estate industry.

Table 5: Real Estate Firms and Capital Market Effect

Variables	Income Expense Ratio as Dependent Variable			Annual Stock Return as Dependent Variable		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
S&P Global Equity		0.001	-0.001		-0.014	-0.020
		(0.13)	(-0.47)		(-1.23)	(-1.58)
Market Cap as % of GDP	**0.004**		**0.005**	0.013		0.019
	(2.01)		**(2.06)**	(1.13)		(1.63)
Revenue Growth	**0.004**	**0.004**	**0.004**	0.002	0.003	0.002
	(2.79)	**(2.94)**	**(2.80)**	(0.16)	(0.32)	(0.20)
Asset Growth	**-0.005**	**-0.005**	**-0.005**	-0.096	-0.017	-0.147
	(-1.85)	**(-1.95)**	**(-1.86)**	(-0.44)	(-0.18)	(-0.67)
GDP Growth	-0.025	0.017	-0.018	0.127	**0.434**	**0.318**
	(-0.84)	(0.67)	(-0.55)	(0.82)	**(3.37)**	**(1.91)**
Intercept	**1.147**	**1.117**	**1.098**	-0.671	**-1.687**	**-1.194**
	(7.58)	**(6.24)**	**(5.96)**	(-0.82)	**(-1.92)**	**(-2.10)**
Adj.R Square	0.08	0.08	0.08	0.09	0.09	0.11
No. of Obs.	714	777	714	571	629	571

The above table presents regression results of real estate firms and capital market effects. The capital markets are primarily represented by internal factors, i.e., market capitalization, and external factors, i.e., Standard and Poor's Global Equity ranking for India. Other variables are defined in Table 1 legend. The upper part reports the estimates. Numbers in parentheses are *t*-statistics.

Money flows are a broad term for assessing money circulation in economic activities. The role of money flows to depict the circular flow of money affecting the real estate sector. It indicates the savings, amount of money exchanged, and capital investment. Table 6 reports the relationship between the money flows in the economy and with real estate sector. Broad money availability and gross domestic savings positively affect the income and expense ratio of real estate firms. Models 2 and 3 show positive and significant coefficients for broad money and gross domestic product. Model 4 includes both variables and gross capital formation, and there is no significant association with the income-expense ratio. However, the coefficient signs are positive. Gross domestic savings is positively and significantly related to stock return (Model 7 and 8). Overall,

the results demonstrate that money flows, notably savings in the economy, benefit the real estate industry.

Table 6: Real Estate Firms and Money Flows in the Economy

Variables	Income Expense Ratio as Dependent Variable				Annual Stock Return as Dependent Variable			
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
GDS as % of GDP			**0.040**	0.021			**0.333**	**0.477**
			(2.17)	(0.72)			**(2.80)**	**(2.72)**
Broad Money as % of GDP		**0.013**		0.008		-0.016		-0.073
		(2.22)		(0.77)		(-0.41)		(-0.90)
GCF as % of GDP	-0.006			-0.001	**0.069**			0.037
	(-0.91)			(-0.10)	**(2.12)**			(0.68)
Revenue Growth	**0.004**	**0.004**	**0.004**	**0.004**	0.003	0.003	0.002	0.003
	(2.93)	**(2.91)**	**(2.92)**	**(2.89)**	(0.29)	(0.26)	(0.20	(0.26)
Asset Growth	**-0.005**	**-0.005**	**-0.005**	**-0.005**	0.004	-0.006	-0.020	-0.017
	(-1.96)	**(-2.01)**	**(-2.04)**	**(-2.03)**	(0.04)	(-0.06)	(-0.21)	(-0.18)
GDP Growth	0.037	0.011	-0.019	-0.003	0.048	**0.256**	0.366	**-0.161**
	(1.36)	(0.54)	(-0.71)	(-0.10)	(0.30)	**(2.51)**	(0.29)	**(-0.91)**
Intercept	**1.028**	0.287	0.171	0.096	0.264	0.471	**-9.220**	**-7.040**
	(6.09)	(0.72)	(0.38)	(0.21)	(0.30)	(0.16)	**(-2.94)**	**(-1.87)**
Adj.R Square	0.08	0.08	0.08	0.08	0.09	0.08	0.10	0.12
No. of Obs.	772	777	777	772	624	629	629	624

The above table presents the results of the multivariate analysis of real estate firms and money available in the economy. It reports the estimates of the pooled OLS regression. The regression models present the effect of available money after controlling for firm and economic factors. We use firm factors as control variables such as Revenue Growth and Assets Growth, the economic factor as GDP Growth. Money availability is primarily represented by savings, a broader money supply, and capital formation in the economy. The variables are defined in Table 1 legend. The estimates of regression models are reported in the upper part. Numbers in parentheses are *t*-statistics.

Conclusions

India has been going considerable changes economically since its first significant liberalization policy in the early 1990s. It has experienced an improved institutional framework, a burgeoning middle class, continuing economic growth, increased household consumption and savings, and a young and vibrant labor force. Most of the real estate studies in India highlight the opportunity for real estate investment benefits, including the effect of deregulation implications in the industry. This paper studies the macroeconomic variables to elicit the signals transpiring and affecting the real estate firms in India.

The results suggest that real estate firms are positively and significantly related to the underlying economic activities. Macroeconomic variables signal a potential increase in the real estate industry's performance. The increase in investment domestically or internationally are important for the growth of the real estate sector. Capital markets growth has limited influence on this sector. Personal remittances, a significant amount for the economy, positively influence real estate activities. Money flows, notably savings in the economy, have a beneficial effect on the real estate industry. However, the rural economy has little effect on real estate firms.

This paper provides insight into the dynamics of real estate firms over the seventeenth year of 2001 to 2016. There is evidence of diversification in their investment portfolio for capital market investors. Indian capital markets and the real estate sector have gone through deregulation and integration with the global economy in the last two decades. However, the results in this paper demonstrate that macroeconomic variables provide a mixed signal for Indian real estate firms. It indicates that the Indian real estate sector is stymied by intricate rules and regulations at the state and federal levels. There is a need to have a transparent and improved regulatory structure for the real estate industry to reap the benefits of the expected growth of the economy. Importantly, it will generate significant interest among domestic and international stakeholders in the real estate sector.

The findings of the paper provide helpful directions in which to extend research. First, the reals estate firm leverage and capital employed should be studied in more depth. This extension should account for the varying leverage of the firms over time and the proportions of capital employed with underlying economic growth. Second, these macroeconomic variables can be analyzed with the manufacturing industries' performance and compared with the real estate firms.

Limitation of the Paper: The paper uses data from 2001 to 2016. India demonetized significant value currencies, i.e., INR 500 and INR 1,000, almost 86 percent of total cash in circulation in November 2016. This step has substantially affected the real estate sector that deals with cash money. The latest data can provide more information and analysis, mainly post-2016, including demonetization and the COVID-19 pandemic. Recently, Indian Govt. has introduced several measures, including deregulations, to boost the real estate sector and the general economy.

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